

Virginia's Coastal Resources Management Program links state, local, and federal efforts to enhance Virginia's coastal resources. Virginia's coastal zone includes the 29 counties and 15 cities of Tidewater Virginia, and all tidal waters out to the three mile territorial sea boundary. The program includes state laws and policies to protect and manage Virginia's coastal resources, implemented by the Departments of Environmental Quality, Conservation and Recreation, Game and Inland Fisheries, and Health, and the Marine Resources Commission. The Department of Environmental Quality serves as lead agency for the program.



Virginia's Sustainable Future

"The earth belongs to the living. No man may by natural right oblige the lands he owns or occupies to debts greater than those that may be paid during his own lifetime. Because if he could, then the world would belong to the dead and not to the living."

- Thomas Jefferson

Mark your calendars! Next June 16, 17 & 18 are the dates, and Richmond is the place for the first-ever statewide sustainability conference in Virginia. As Jefferson alluded to long ago, sustainable development meets the needs of the present without compromising the ability of future generations to pursue their own needs.

The "Virginia's Sustainable Future: Solutions for the Environment, Business and Communities" conference will bring together a diverse mix of businesses, community groups and government representatives to consider the benefits of environmental and resource-efficiency concepts. Major themes of the conference will be sustainable communities, the built environment, innovative technologies, and industrial stewardship.

Governor James S. Gilmore III and Secretary of Natural Resources John Paul Woodley, Jr. have been invited as keynote speakers. Also invited is the Honorable Hullahen Williams Moore, Commissioner of the Virginia State Corporation Commission. The conference will feature nationally-recognized speakers such as William McDonough, Dean of the University of Virginia School of Architecture and founder of the Institute for Sustainable Design, Ray Anderson, Chairman and Chief Executive Officer of Interface, Inc., and William Browning Founder of Green Development Services, Rocky Mountain Institute.

Conference participants will have the opportunity to hear presentations about energy-efficient buildings, low-impact development, new materials and technologies, and innovative leadership, including participation in an interactive "solutions forum."

The conference is being presented by the Virginia Housing and the Environment Network. Sponsors include the U.S. Department of Energy, National Oceanic and Atmospheric Administration, Environmental Protection Agency, Virginia Department of Environmental Quality (DEQ), Virginia Coastal Program, DEQ's Office of Pollution Prevention, Virginia Housing Development Authority, Virginia Department of Housing and Community Development, Virginia Environmental Endowment, Virginia State Corporation Commission, Virginia Manufacturers Association, AlliedSignal Inc., and McGuire, Woods, Battle and Booth. Supporters include the Chesapeake Bay Local Assistance Department, U.S. Green Building Council, Virginia Association of Counties, Virginia Municipal League, Virginia Power, Virginia's A.L. Philpott Manufacturing Extension Partnership, and the Virginia Departments of Conservation and Recreation, Historic Resources and Transportation. If you want more information on the "Virginia's Sustainable Future" conference, visit the conference website at www.deq.state.va.us. To receive registration materials, call (804)360-1500 or e-mail your request to malloymsm@aol.com.

Message from the Director

I am delighted to announce that we will soon be taking steps to increase the effectiveness of the Virginia Coastal Program. We are in the process of creating an executive level Coastal Resources Council



Dennis H. Treacy

and a staff level Coastal Resources Committee to help direct the program's future. While developing the Coastal Program's strategic plan last year, many of you recommended this kind of leadership.

The Council and its staff committee will include representatives of state agencies, local governments, coastal-related businesses and environmental groups. We will be looking to the Council to prioritize and provide guidance on cross-cutting coastal issues and to provide a forum for resolution of those issues. This is one way in which DEQ will be fulfilling its mandate to foster comprehensive and coordinated coastal policy and planning in the Commonwealth. I look forward to working with all of you to make our coastal zone an even better place.

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Building for a Sustainable Future

The Cape Charles Sustainable Technologies Industrial Park (STIP) has taken a giant leap for parks of its type nation-wide. On January 29, 1999, Governor Jim Gilmore announced that the first building in the park had been leased to Energy Recovery, Inc. (ERI), a Norwegian firm which manufactures ceramic cylinders used in desalination.

The Cape Charles STIP is a microcosm of a county-wide Sustainable Development Initiative designed and funded by the Coastal Program, which began in 1991 when the Program offered the county a 4-year, match-free grant to create new, enforceable policies to protect coastal habitat and promote sustainable economic development such as ecotourism and aquaculture. To date the program has invested over 1.8 million dollars in Northampton County, including \$343,028 for the STIP



Building One at Cape Charles Sustainable Technologies Industrial Park. Photo by Tim Hayes.

which covered a community design charette, planning and engineering, promotional materials, construction of a boardwalk and dune overlook for the park. See page 10 for details on the STIP nature trail.

“Energy Recovery’s decision to locate in Northampton County will enhance Virginia’s position as a leader for companies involved in the most advanced 21st century technologies,” stated Governor Gilmore at the January celebration. The company is devoted to the commercialization of its proprietary Pressure Exchanger technology, which will improve many wasteful pumping processes and make sea water desalination very affordable for any coastal community worldwide. The manufacturing space - 27,200 square feet - should be ready for the company to start production this spring.

The new building, constructed at a cost of \$1.9 million dollars, is one of the first in the nation to be designed to the specifications of the U.S. Green Building Council, a consensus coalition of the building industry, created to develop and implement environmental building policies and practices that improve both the built and natural environments.

Among the 20 or so eco-industrial parks in the planning stages nationwide, Cape Charles is the first to have an actual building and resident business. “The time has come to show that our need for industrial commodities must be satisfied without imposing a future liability on our children,” said Leif Hauge, President of Energy Recovery, Inc., following the Governor’s announcement.

Showing his support for the county’s economic development goals, Governor Gilmore also announced that the park would receive \$170,000 from the Governor’s Opportunity Fund for road construction and other infrastructure projects in the park.

Cape Charles STIP Principles

- Encourage the revitalization of the local industrial economy and historic port of Cape Charles.
- Create family-wage employment and training opportunities for local residents.
- Serve as a model and national prototype of an integrated approach to land development and industrial operations, embodying sustainable approaches to the local economy, environment and culture.
- Serve as a model for advancing the traditional settlement patterns of the Eastern Shore towns and employment centers.
- Incorporate comprehensive approaches to land and natural resource conservation, wise use of renewable resources, and ecologically-based industrial development in all aspects of design and development of the project.

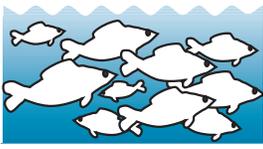
A town rich in natural and cultural assets, including significant unspoiled habitats, Cape Charles and Northampton County have been working with the Virginia Coastal Program to simultaneously invest in and protect its assets and build a lasting economy. Northampton County was selected from among 400 applicants as one of four sites for a national demonstration project on eco-industrial development, and the STIP has received national attention for its efforts in ensuring environmental sensitivity in its design, economic viability, and social equity. “The Port of Cape Charles Sustainable Technologies Industrial Park is a commitment to development that is good for business, the environment and people,” states Tim Hayes, Director of Sustainable Development for Northampton County.

The Cape Charles STIP will promote profitable and environmentally friendly businesses by co-locating manufacturers to form a symbiotic relationship among the park’s tenants. The Park is designed to have zero emissions, and will demonstrate resource efficiency and pollution prevention, including a water recycling system, and a material reuse exchange by the park’s tenants. The idea is that the waste stream from one company becomes an input to a neighboring company. Thus, the industrial processes will mimic natural processes where there is no waste because waste equals food.

While tenants must meet minimum Sustainability Criteria, or standards of design and operation, to be eligible for space in the park, they will be encouraged to exceed these criteria. Tenants will be eligible for up to a 12% reduction in their lease rates for hiring more local people, paying higher wages, providing full benefits packages, providing training, creating and participating in industrial ecologies, reducing and recycling, making bigger investments in their companies and Northampton communities, buying local products and services, and working toward other specific community goals. ERI expects to hire 35 local residents.

The STIP began attracting sustainability-minded business to Virginia’s Eastern Shore back in 1995 before ground was even broken on the park in the fall of 1996. Solar Building Systems, a subsidiary of the Swiss-owned Atlantis Energy Systems, began production in a former elementary school in 1995. Solar Building makes solar roof panels and photovoltaic building exteriors that convert sunlight to energy, and has hired more than 25 employees from the local area.

For more information about the Cape Charles STIP or the Northampton SAMP, please contact Tim Hayes, Northampton County Sustainable Development Office at (757)331-1998, or Laura McKay, Virginia Coastal Program at (804)698-4323. 



Horseshoe Crab Landings on the Rise in Virginia, Posing Management Questions

Horseshoe crabs, one of the world's oldest, and to many, one of the strangest sea creatures, have been the focus of much debate over the last year. Despite the importance of the horseshoe crab, not only in marine and estuarine systems, but also to several major industries, biomedical products and eco-tourism, little is known about the population dynamics of this species. Compared to other fisheries, fishing regulations for the horseshoe crab has been minimal or nonexistent, and data on the horseshoe crab has been sparse and inconsistent. Some of the recent surveys of horseshoe crabs along the mid-Atlantic coast suggest that horseshoe crab populations are stable, while others suggest that they are declining. Trawl surveys in the Delaware Bay show a significant decreasing trend in abundance, but other state and federal trawl surveys have shown no trend. Sampling surveys of horseshoe spawning and egg counts have been inconsistent, due in part to the need for better sampling and gear techniques.

Reported commercial landings of horseshoe crabs, however, clearly show a significant increase in the harvest of crabs during the 1990s up and down the Atlantic Coast. This is attributed in part to a combination of improvements in harvest reporting requirements, and an increase in total fishing effort. Yet there are still many inconsistencies in reporting, and landings data may not accurately reflect true landings.

Current efforts to improve our knowledge and management of the horseshoe crab, has brought to the table state and federal fishery resource agencies, conservation organizations, fisheries interests and others reliant on the future of our horseshoe crab populations. All parties at this table agree that better data is needed to formulate better stock assessments of the horseshoe crab.

Horseshoe crabs, not true "crabs", but more closely related to spiders, serve as an important food source for migratory shore birds, the federally-threatened loggerhead sea turtle, finfish, crabs and other invertebrates. Horseshoe crabs are critical to the biomedical industry, which collects their blood for medical purposes and then returns the crabs to the sea. Horseshoe crabs are also a low cost bait source for the eel, catfish and conch fisheries. Due to their excellence as bait, their slow rate at reaching sexual maturity (10 years), an increase in harvesting since 1986, and their ecological importance as a source of food, many scientists believe horseshoe crabs are at serious risk.

Use of the Horseshoe Crab

Scientists report that several species of shorebirds feed primarily on horseshoe crab eggs, during their spring migration from the tip of South America to the Arctic, and abundance of horseshoe crab eggs exceeds that of other available food sources. The concentration of birds, and their crab-egg consumption, peaks on the Delaware Bay, where a 1996 study reported the numbers of six species of birds between 900,000 to 1.5 million. The birds, burning muscle tissue by the time they reach the Delaware Bay, land on sandy beaches, and begin to feed upon horseshoe crab eggs, before continuing on to their nesting grounds in the Arctic. According to one study, at least 11 species of migratory birds use horseshoe crabs to replenish their fat supply, and other studies show that some species nearly double their body weight feeding on the horseshoe crab eggs. This weight gain at Delaware Bay is considered the highest recorded for any stopover site in the world. In Virginia, wildlife scientists and bird conservation groups report this same behavior in areas such as Tom's Cove on Assateague Island.

Significant declines in shorebird numbers have been documented in the Delaware Bay between 1985 and 1997. The Delaware Division of Fish and Wildlife reported a 45 percent decline in peak counts of shorebirds from 1990-1996 compared to data from 1986-1989. Environmental scientists and fishery managers have become increasingly concerned that the increased horseshoe crab landings and continued beach collection of horseshoe crabs, whose numbers remain unclear, poses a risk for already-stressed shorebirds. Virginia conservation organizations, such as the Virginia Audubon Council and the Virginia Society of

Ornithology, point out that the state shares the Atlantic flyway shorebird populations with Delaware Bay, so that fewer shorebirds managing to leave Delaware Bay likely means fewer shorebirds in the future for Virginia.

Horseshoe crabs are also critical to human health. The biomedical industry collects the blood of the horseshoe crab to produce LAL, a substance used in cancer and meningitis research, and to test most medical equipment and all new drugs for bacterial contamination. The crabs are returned largely unharmed to the water; mortality is estimated at 10 percent.

Conch fishermen depend on the horseshoe crab as bait, and the catfish and eel fishermen also use horseshoe crabs as a bait source for their catches. Eel bait fishermen prefer female horseshoe crabs with eggs. In Virginia, fishermen estimate their bait needs to be about 1,462,000 horseshoe crabs per year. According to the Virginia Marine Resources Commission (VMRC), prior to 1998 the vast majority of horseshoe crabs used in Virginia were imported, because it was cheaper for watermen to buy from other states than to harvest in Virginia, and Virginia did not have a direct fishery. Since April 1998, as a result of reductions of crab harvest from other states, Virginia has had a direct harvest and fishery for horseshoe crabs to help meet this continued bait need.

Value of the Horseshoe Crab

In making sound or sustainable fishery management decisions, fishery managers are required to consider socioeconomic factors along with the best ecological science. Numbers for the value of horseshoe crabs to the fishing and bird-watching industry vary widely for the mid-Atlantic, and better economic estimates are needed.

Conch industry reports to the Virginia Marine Resources Commission indicate that Virginia's output of processed conch is worth \$7 million a year, and multiplies to \$42 million in shoreside economic activity. The 50 or so full-time conch fishing boats are a small, but active segment of Virginia's \$500 million seafood industry. While only 9 percent of the fishing income (of respondents in a 1998 study of Delaware watermen) is attributable to the direct sale of horseshoe crabs, an average of 58 percent of the eel and conch fishing income depends on using horseshoe crabs as bait.

The biomedical global market for the LAL produced from mid-Atlantic crabs is reported to be at least \$50 million based on direct sales. Multipliers of this figure could be significant, certainly in the billions, when considering the sale of every medical item sold as sterile in the United States.

According to the US Fish and Wildlife Service, the 1996 regional economic impact resulting from expenditures by wildlife watchers (predominantly bird-watchers) in New Jersey and Delaware, is the creation of 15,127 jobs which generate \$399 million in personal income. Total expenditures in 1996 for the primary purpose of wildlife watching in these states was just over \$6 million. Virginia has not calculated the benefits of maintaining a sustainable horseshoe crab harvest to the ecotourism industry, however, a study contracted by Chincoteague National Wildlife Refuge in 1997 reported that the wildlife watchers to this refuge alone, who are particularly drawn to the spectacle of migrating shorebirds and waterfowl, contributed \$10 million dollars to the Chincoteague community and 1/3 of area jobs. Other horseshoe crab and shorebird areas such as the Eastern Shore and Virginia's River Country on Virginia's Northern Neck and Middle Peninsula have been targeted for extensive ecotravel investment by state and private initiatives.

Current Horseshoe Crab Population Trends

Sound management of horseshoe crabs along the Atlantic seaboard is complicated by the lack of biological and population data, and poor understanding of the movement of horseshoe crab populations along the Atlantic coastline. Horseshoe crabs are most abundant between Virginia and New Jersey with Delaware Bay, the largest nursery for the crab, at the center of species concentration on the Atlantic Coast. Globally, the Delaware Bay is one of three or four locations with

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NEWS AROUND THE ZONE

1 Restoring Elizabeth River Wetlands

The loss of wetlands, forested areas and vegetated buffers in the Elizabeth River watershed has contributed to the loss of wildlife habitat and degraded water quality. The restoration of these areas is considered a high priority in a Watershed Action Plan developed by the Elizabeth River Project (ERP).

During the summer of 1998, the non-profit Elizabeth River Project, in partnership with Dr. Walter Priest, Wetland Scientist at the Virginia Institute of Marine Science (VIMS), completed a Shoreline Reconnaissance of the Elizabeth River watershed to identify and prioritize potential habitat/wetland restoration sites adjacent to the highly urbanized Elizabeth River. This project was funded with a \$9,983 grant from the Virginia Coastal Program, and also received support from a local industry as part of a Supplemental Environmental Project Program established by the Virginia Department of Environmental Quality.

The first step of the Reconnaissance project

was to compile and review all available information on the area's current and historic wetland habitat, including photographs, maps, charts and other information. Project staff reviewed a shoreline inventory conducted by the Hampton Roads Planning District Commission (HRPDC), aerial video produced by VIMS/HRPDC, Tidal Marsh Inventories produced by VIMS, and Shoreline Situation Reports produced by the Virginia Department of Health. Staff also reviewed a report entitled "Historic Losses of Wetlands Habitat in the Elizabeth River" (Priest and Hopkins, 1996), funded by the Virginia Coastal Program in 1995. Information regarding natural heritage resources and cultural resources was obtained from the Virginia Department of Conservation and Recreation's Division of Natural Heritage and the Virginia Department of Historic Resources.

The next phase of the project included an aerial survey followed by site-specific ground assessments of twenty-eight sites identified for their restoration potential using a number of groundtruthing parameters, including vegetation, elevation, adjacent land use, and utility constraints. Rough estimates were obtained of the restoration area available, amount of excavation required, the tidal range and general feasibility of site restoration. Each site was evaluated for the following criteria: size, hydrology, utilities, ownership, habitat value, endangered species, landscape position, adjacent land use, construction access, watershed area, substrate, cultural resources, topography, contamination, and public access. This qualitative selection process helped to determine which sites have the highest restoration potential and are the most cost effective restoration candidates.

Ranking of these sites resulted in five top candidates. One of the sites is already underway as a buffer improvement project through a partnership between the Elizabeth River Project, the City of Norfolk, a local shipyard and the neighboring community. ERP staff are currently working with the owners of several of the other top ranking sites regarding development of conceptual designs for restoration activities at these sites. Emma Ramsey - ERP

For more information on this project, please call Emma Ramsey, Elizabeth River Project, at (757) 625-3648.

2 Interpretive Signs Added to New Point Comfort

In April 1998, a new State Natural Area Management Preserve was dedicated at New Point Comfort on the southern tip of Mathews County. The preserve, purchased with funds from the Virginia Coastal Program, protects a combination of primary and secondary dunes, saltmarshes, and an interior of mixed deciduous and pine forested wetlands, and is important habitat to many coastal species. Not only is the New Point Peninsula important for its ecological diversity, it is also a site of great historical value. New Point Comfort lighthouse, commissioned by Thomas Jefferson in 1804, is visible just off-shore of the Peninsula.

To provide a non-destructive way to get close to the preserve's sensitive resources, Mathews County constructed a boardwalk in the preserve with assistance and funding from the Virginia Coastal Program. Since it opened, the boardwalk has been a very popular destination. Nearly 100 hundred visitors have arrived on a nice Saturday afternoon to appreciate the preserve's scenic beauty and serenity, and view the birds and other wildlife attracted to this rich coastal habitat.

In December 1998, to further enhance visitor understanding of the preserve's habitats and its cultural and historical significance, the Virginia Coastal Program provided funding to the The Nature Conservancy to produce a series of interpretive signs to be located on the boardwalk. These signs provide an introduction to the preserve and its partners, describe the ecology of the beaches and saltmarshes of New Point Comfort and the Chesapeake Bay, and interpret the historical significance of the site, including the New Point Comfort lighthouse.

The 95-acres which makes up the core of the preserve was purchased in 1995 by The Nature Conservancy with funding from the Virginia Coastal Program. Subsequent private donations to TNC have expanded the preserve to the 111 acres it





Photo by Sam Lindblom

is today. The Nature Conservancy manages New Point Comfort in partnership with Natural Heritage staff at the Department of Conservation and Recreation.

If you would like to visit the new New Point Comfort Preserve and Boardwalk, and need directions to the site, please call Mathews County at (757)725-7172.

3 King & Queen Landscape Assessment Project Sparks Community Action

A multi-year community-based resource protection project in rural tidewater Virginia is nearing completion in King & Queen County, but not before generating more than a fair share of attention and unexpected results.

Originally seed-funded with a \$14,500 grant from the Virginia Coastal Program, the King & Queen Community Landscape Assessment Project has expanded to incorporate a Phase II effort funded by EPA's Green Communities, a Region III pilot project undertaken in association with the National Association of Counties and the Alliance for the Chesapeake Bay. To date, an additional \$20,000 in funding has been committed by NACo and EPA, significantly broadening the scope and deliverables for the project. As in nearby King William County, the King & Queen project was undertaken by the Mattaponi and Pamunkey Rivers Association (MPRA), a local non-profit conservation group.

The expanded project focused on four major elements: a community landscape preferences survey, a community profiling exercise, a citizen review of local resource protection ordinances, and a GIS mapping demonstration project. In Phase I of the project, a protocol, methodology, and community survey instrument was developed, and featured a photo gallery of 20 typical "countryside" landscapes

in the county, selected by 30 volunteer photographers. Nearly 300 County citizens "ranked" the various landscapes as part of a broader survey to determine the current availability and need for facilities, services, or goods in the County, a demographic profile, and finally a survey of "favorite places".

The community profiling study was conducted by members of a project team made up of county citizens. Pat Tyrell with the Tidewater Resource Conservation and Development Council coordinated the survey. Prior to the survey, the project team evaluated the utility of a series of possible survey questions, ultimately selecting a short

list of three queries, and rewording many of the questions to make them more relevant and of the most use to county leaders. It was at this phase of the project that the subject of recreation programming as a community priority was first raised in the course of discussions between the participants.

Other members of the project team worked with Nancy Herman-Thompson, the County Zoning Administrator, on a review of local resource protection ordinances, and their proposed recommendations for revisions will be included in MPRA's final project report.

A third group of project team members, led by Billy Mills with MPRA and Planning Commission member Temple Ryland, developed a new County map that prominently features natural and cultural resources and County attributes. A new map and a digital GIS map for use by planners and County leaders has also been produced.

MPRA led a parks and open space workshop for County Supervisors and Planning Commissioners in late November, and is currently working with County staff to develop a TEA-21 grant request to VDOT to support an open space and natural areas acquisition and trails development plan for the County. A county-wide "Town Meeting" was held February 23 to set the stage for MPRA's presentation of the community project results, and to review the pending Tea-21 grant proposal. Billy Mills - MRPA

For more information on this project, please call Billy Mills, MPRA, (804) 769-0841.

4 Heritage Tourism Taking Hold in Town of West Point

Building upon momentum and progress made in early 1997, the King William Heritage Corridor Project continues to gather steam in the

middle peninsula. Town leaders and citizen volunteers in West Point who participated in the innovative feasibility study are working to implement many of the recommendations that flowed from the original 1996 project report.

The project was developed and facilitated for King William County and the Town of West Point by the Mattaponi and Pamunkey Rivers Association (MPRA), a local non-profit organization. Citizens from the County and the Town of West Point contributed to the year-long project, surveying the public and evaluating the potential for resource-based tourism in the King William/West Point community. The project was funded by a \$40,000 grant from the Virginia Coastal Program to King William County.

The Town also successfully applied for an additional \$100,000 in funding through VDOT's ISTE A grant program. This grant will fund the construction of a new bike path connecting visitors and residents with the downtown area, suburban West Point, and Mattaponi river wetlands and marsh crossings. The bike trail will feature route and safety signage. Future plans call for a link from the path to the soon-to-be revitalized retail area on Main Street, and a Pamunkey River historic fort site.

Perhaps the most exciting development has been the award of an additional \$27,000 VDOT/ISTEA grant for development of a historic walking tour of the Town's recently designated Historic District. Town leaders envision a series of informative markers, interpretive signs and trail-head kiosks containing tour guide maps of the District. MPRA staff continues to work closely with Town leaders and citizens in planning efforts to bring the historic trail to life.

West Point leaders are also planning a number of significant regional initiatives, including replacing both the Town's bridges with larger fixed spans, and a possible bike path link with a King & Queen initiative near and adjacent to the new regional airport and co-located industrial park across the York River. The Town of West Point and MPRA are currently working together on a plan for a water trail project that would feature inter-modal travel links for bikes and paddlecraft, with access to both the Mattaponi and Pamunkey Rivers and New Kent and King & Queen counties. Billy Mills - MRPA

For more information on this project, please call Billy Mills, MPRA, (804)769-0841.

Chesapeake 2000: Renewing the Chesapeake Bay Agreement

“Chesapeake 2000” refers to the concerted effort to review and renew the Chesapeake Bay Agreement in the year 2000, and to define the priority goals and commitments for the Chesapeake Bay Program that will carry us through the first part of the next century. Toward that end, we will be asking some key questions - where has the Chesapeake Bay Program been and where does it go from here? - and we are seeking input from citizens, scientists and government officials to help answer these questions.

Since 1983, the Chesapeake Bay Agreement has set the course for the Chesapeake Bay Program's efforts to restore the Bay, and its habitats and resources. The CBP is now developing a renewed Agreement to be signed in 2000, which will set a well-defined course for Bay restoration efforts in the first part of the new century. The last new Bay Agreement was signed in 1987, and amendments to the Agreement were made in 1992.

The Chesapeake Bay Program is a cooperative, intergovernmental partnership. The 2000 Agreement will be signed by the Chesapeake Executive Council - the Governors of Maryland, Pennsylvania and Virginia, the Mayor of the District of Columbia, the Chairman of the Chesapeake Bay Commission, which represents the state legislatures, and the Administrator of the Environmental Protection Agency, which represents the federal government.

The broad objectives of the 1987 agreement included: protecting living resources; improving water quality (the most well-known being the 40 percent reduction of nutrients by the Year 2000); managing public growth and development; improving public information, education and participation; and establishment of a Bay Program management structure to carry out all of this. The Bay Agreement outlined a series of commitments and objectives for each goal.

Development of the renewed Bay Agreement, which may include new commitments to reach the overall goals of the original Bay Agreement or new goals, includes three major efforts:

The first effort is the “Chesapeake Renewal” project being conducted by the Alliance for the Chesapeake Bay. Congress designated the Alliance to play a significant role in the review of the Chesapeake Bay Program in preparation for development of the renewed Agreement. The Alliance is carrying out that responsibility through a questionnaire, interviews, and focus groups to gather input from the public, key stakeholders, and all levels of government about the Bay Program - its structure, accomplishments and setbacks - and its future direction. The Alliance will also be involved in forums that will be held to explore key issues central to developing the draft Agreement. The Alliance will report its findings to Congress at a later date.

The Alliance recently included a public opinion questionnaire in the widely read Bay Journal, seeking both the public's input on the Bay restoration effort to date, and the program's effects on the status of Bay resources. The questionnaire was also sent to all local governments in the Chesapeake Bay watershed in a copy of Bay Currents, a publication issued by the CBP's Local Government Advisory Committee. The questionnaire is available on the CBP's website.

The second effort, “Chesapeake Futures”, is being coordinated by the CBP's Scientific and Technical Advisory Committee (STAC). This effort is examining how the Bay system might respond to changes in population, the world and regional economy, technology, and other factors through the year 2030. More specifically, the study is looking at how three levels of restoration efforts will affect the resources of the Chesapeake Bay system: 1) the current level of effort; 2) a full implementation of existing commitments, and 3) the maximum restoration effort technically possible.

A third effort contributing to the renewal of the Bay Agreement is an internal review by the CBP's subcommittees under the direction of the Implementation Committee, the Bay Program oversight committee. There also will be an independent “peer review” of the Bay Program by a number of outside experts, including estuary managers in other regions throughout the country.

Pulling all of this information together and developing a draft 2000 Agreement will be the responsibility of the Chesapeake 2000 Planning Committee, generally referred to as the C2K Committee. The C2K Committee, which is composed of representatives of the Agreement signatories, expects a first draft of the renewed Agreement to be available for public review and comment early in the fall of 1999. The Executive Council has requested preliminary options and recommendations for a renewed Agreement by the 1999 meeting of the Council, and a renewed Bay Agreement to be presented for adoption in the year 2000.

Interested citizens are encouraged to mail their written comments and/or suggestions regarding the development of a renewed Agreement to Larry Minock at the Department of Environmental Quality's Chesapeake Bay Program Office (629 E. Main Street, Richmond, 23219), or send them via E-mail (ldminock@deq.state.va.us). Information on opportunities to review both the first and second draft of the Agreement will be widely distributed as soon as those review and comment schedules are known.

All major CBP documents can be viewed and downloaded from the CBP's website (<http://www.chesapeakebay.net>).

Goals of the 1987 Bay Agreement

- Provide for the restoration and protection of the living resources, their habitat and ecological relationships;
- Reduce and control point and nonpoint sources of pollution to attain the water quality condition necessary to support the living resources of the Bay;
- Plan for and manage the adverse environmental effects of human population growth and land development in the Chesapeake Bay watershed;
- Promote greater understanding among citizens about the Chesapeake Bay system, the problems it faces and the policies and programs designed to foster individual responsibility and stewardship of the Bay's resources;
- Increase opportunities for citizens to participate in decisions and programs affecting the Bay;
- Promote increased opportunities for public appreciation and enjoyment of the Bay and its tributaries;
- Support and enhance the present comprehensive, cooperative and coordinated approach toward management of the Chesapeake Bay system; and
- Provide for the continuity of management efforts and the perpetuation of commitments necessary to ensure long-term results.

FESTIVALS AND EVENTS CELEBRATE VIRGINIA'S COAST...



Dedicating the Water Wizard Van



Photo courtesy of Virginia NRCS/USDA.

The Water Wizard Van, a traveling water resources educational exhibit, was unveiled at the Virginia State Fair on September 29, 1998. The 12-foot van houses dozens of hands-on, interactive tools to help children and their families understand important water-related processes and concepts. The van will circulate throughout Virginia's coastal zone and the rest of the state, and be available to schools and for public events.

The van was made possible by a partnership of 16 natural resource agencies, private and non-profit environmental groups and organizations, and private businesses, all of whom received a Certificate of Appreciation at the unveiling ceremony. Dennis Treacy, DEQ Director (back row, far right), and Laura McKay, Virginia Coastal Program Manager (front row, far left) each accepted a certificate. The unveiling was attended by Virginia's Deputy Secretary of Natural Resources, Ronald Hamm, and USDA Deputy Under-Secretary for Natural Resources and Environment Glinda Humiston.

For information about reserving the Water Wizard Van, please call Barry Fox, Virginia State University, at (804)524-5848. Visit the Water Wizard Van web site at <http://www.ext.vt.edu/resource/4h/wizard/wizard.html>.

York River Fall Festival



Photo by Virginia Witmer.

play to play "Frog Bog", an interactive game developed by the program to teach children about the importance of wetlands and other habitat for amphibians, and the effects of the loss of this habitat on frogs and other amphibians.

The Annual York River Fall Festival celebrated National Estuaries Day in October 1998. The festival is organized by the Virginia Chesapeake Bay National Estuarine Research Reserve System in Virginia. Photo: Children gathered around the DEQ/Virginia Coastal Program dis-

6th Annual Eastern Shore Birding Festival



Photo by Virginia Witmer.

Over 700 avid and amateur birders alike swooped down on Northampton County on Virginia's Eastern Shore to participate in the Sixth Annual Eastern Shore Birding Festival on October 9 - 11, 1998.

Once again, the songbird banding station was a popular stop (photo above). This year's highlight was the breaking of the festival's species count record with the sighting of a Cape May Warbler by Ken Kaufman, the festival's keynote speaker and renowned author. This little warbler brought the total bird species sighted during the festival to 175 and by the festival's end this number had increased to 180!

The next festival will be October 8-10, 1999.

2nd Annual Green Sea Festival



Photo by Cindy Butler.

On October 10, 1998, the Cities of Chesapeake and Virginia Beach held the 2nd Annual Green Sea Festival. As an educational component of the Southern Watershed Special Area Management Plan, an effort of the two cities, facilitated by the Hampton Roads Planning District Commission and the Virginia Coastal Program, the Festival was created to emphasize the value of the cultural and natural resources of the Southern Watershed. Over 1000 visitors from the region were greeted with informational displays highlighting sustainable businesses and special cultural activities, including a display by organic food growers in Virginia (photo above). The next festival will be October 2, 1999.

Where Does Your Bay License Plate Money Go?

Do you have a Chesapeake Bay license plate and have you wondered where your \$25 went? For each Bay license plate sold or renewed, \$15 goes to the Chesapeake Bay Restoration Fund, and \$10 to DMV. Any state agency, local government, school, or nonprofit group can apply for funding to restore the Chesapeake Bay. Applications are reviewed by the Chesapeake Bay Restoration Fund Advisory Committee, chaired by Senator Frederick Quayle (R-Chesapeake) who sponsored the original legislation creating the Fund. The committee sends a list of recommended projects to the General Assembly for approval.

The Restoration Fund has received about \$300,000 per year since its inception in 1992. This spring, the Committee will distribute \$377,751, the highest annual amount to date. See this page and page 9 for a list of 1999 projects that the committee has recommended for funding. If approved by the General Assembly and Governor, they will begin May 1999.



The fund supports many education projects, including volunteer and teacher training, special school projects, and the development of educational curricula and materials, and public information.

Other projects are specifically restoration activities. Here are a few highlights of restoration projects completed in 1998:

- **Riparian Restoration Demonstration Projects and Workshops**
\$20,000

The Department of Conservation and Recreation conducted four workshops, entitled Methods of Riparian Restoration and Stream Protection, and four demonstration projects in the Chesapeake Bay watershed in autumn 1997. Over 360 state and local government conservation staff, conservation group representatives and landowners participated in the workshops. The demonstration plantings have been a success and are frequently visited by workshop participants and others. For more information on this project, contact Deborah Mills, DCR, at (804)786-2064.

- **James River GIS Maps**
\$20,000

The James River Association, in cooperation with the James River Watershed Council (made up of Soil and Water Conservation Districts and others), produced a set of GIS maps of the James River Watershed from Richmond to the Bay that depicts natural and man-made elements, including land use and land cover, hydrologic units, non-point source potential ranking, water quality monitoring, point source discharges, wetlands, shellfish resources, and potential stream sediment loadings. The maps support development and implementation of a James River Watershed Tributary Strategy, and were distributed to jurisdictions from Richmond to Hampton Roads. A well attended tributary

strategies conference was also held in the fall of 1997. For more information about this project, please contact Patricia Jackson, James River Association, at (804)730-2898.

- **Mattaponi Shad Hatchery**
\$27,140

The Mattaponi Heritage Foundation used these 1997 funds to expand their shad hatchery operations on the Mattaponi River. For more information about this project, please contact Carl Custalow, Mattaponi Heritage Foundation, at (804)769-4508.

- **CBF Shad Restoration**
\$16,107

The Chesapeake Bay Foundation worked with seven schools in the James and Rappahannock watersheds to train teachers and involve students in raising and releasing shad. The success rate was excellent - of 8,000 shad provided to the schools, 6000 were released. The students and teachers involved, not only learned about the life cycle and habitat needs of shad, but also the shad's historical importance and the value of restoration efforts. A Shad Festival was also held in spring 1998 on the Rappahannock to increase public awareness and appreciation of shad restoration efforts, during which additional shad fry were released. For more information about this project, please contact the Chesapeake Bay Foundation at (804)780-1392.

- **Lynnhaven River Oyster Reef and Seagrass Bed Restoration**
\$20,000

The Virginia Marine Resources Commission used its funding to continue restoration of oyster reef habitat and seagrass habitat in the Lynnhaven River. Funding will also support monitoring of both the reef and seagrass beds through 1999. For more information on this project, please contact Jim Wesson, VMRC, (757)247-2121.

For more information about the Chesapeake Bay Restoration Fund, or to obtain an application for funding, please call Marty Farber of the Division of Legislative Services at 804/786-3591.

Chesapeake Bay Restoration Fund Grants Recommended for Summer 1999

Alexandria Seaport Foundation

703.329.1341
\$20,000
Water Quality/Rowboat Program

Mattaponi Heritage Foundation

804.769.4508
\$40,000
Shad Hatchery Completion

Town of Cape Charles

757.331.2176
\$4,020
Beach Clean Up

Watermen's Museum

757.887.2641
\$4,000
Hands-on Learning Stations

Piedmont Environmental Council

804.977.2687
\$20,000
Conservation Easement Maps for Orange & Albemarle Counties

York County Wetlands Board

757.867.6722
\$10,000
30 Minute Wetlands Video

John Marshall SWCD

540.347.3120
\$520
Wetlands Education Materials

Culpeper Cooperative Extension

540.727.3435
\$500
4H Bay Education Program

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Headwaters SWCD

540.248.4328
\$1,229

Teachers' Water Bus Tour

John Wayland Elementary School

540.828.6081
\$1,600

Outdoor Lab and Learning Center

Northern Virginia Regional Park Authority

703.528.5406
\$2,411

Home & Yard Workshops

Waters Middle School

757.558.2813
\$4,000

Watershed Shad Restoration

Keep Fauquier Clean, Inc.

540.347.3120
\$3,014

Cedar Run Water Monitoring

Eastern Shore Agricultural Research & Extension Center

757.414.0724
\$8,200

Between-bed Crop BMPs

Fairfax ReLeaf

703.324.1409
\$3,956

Woodland Restoration Demos

Valley Conservation Council

540.886.3541
\$20,000

Landowner Ed Program for Conservation Easements

King George Middle School

540.775.2331
\$2,600

Watershed Awareness Project

Louisa County

540.967.0401
\$7,500

Reducing Nutrients from Septics

Elizabeth River Project

757.625.3648
\$28,500

Public Awareness Program

Richmond Health Education Center

804.358.7280
\$7,500

Water Quality Courses

Chesapeake Bay Foundation

804.780.1392
\$20,000

Pollution Reduction Program

Achievable Dream Academy

757.928.6740
\$2,625

Bay Field Trip for Students

Natural Bridge SWCD

540.463.7125
\$1,500

Teacher Training and Resources

Izaak Walton League

540.377.6179
\$10,000

Water Monitor Training

Claude Moore Park

703.421.0443
\$1,004

Enviroscape II Wetlands Model

James River Association

804.730.2898
\$20,000

Easements & Buffer Plantings

VA Marine Resources Commission

804.247.2121
\$18,000

Lafayette River Oyster Reef

Waynesboro Parks & Recreation

540.942.6735
\$2,600

Riparian Buffer Project

Town of Urbanna

804.758.2613
\$4,600

Riparian Buffer Planting

Greater Reedville Association

804.453.6529
\$1,850

Ches Bay Teacher Training

Richmond Community High School

804.271.5699
\$4,900

Ninth Grade Honors Ecology Trip

VA Marine Science Museum

757.437.6030
\$10,800

Salt Marsh Theatrical Program

Thomas Jefferson PDC

804.979.7310
\$2,000

Rivanna Watershed Kiosk

City of Hampton

757.727.6325
\$4,000

3D Home Waste Model

Loudon SWCD

703.777.0457
\$3,900

Riparian Restoration Workshop

Tidewater Oyster Gardeners Association

804.694.4407
\$2,370

GIS for Oyster Garden Sites

Nature's Wonder World, Inc

703.490.0455
\$4,100

7th Grade Hands-on Field Study

Hoffler Creek Wildlife Foundation

757.483.3054
\$17,900

Trail, Signage and Guide Training

Cooperative Extension/Spotsylvania

540.582.7096
\$1,300

Wetland Site Enhancement

Cooperative Extension/King George

540.775.3062
\$5,367

Integrated Pest Management

Virginia Living Museum

757.595.1900
\$5,000

Bay Discovery Box Copies

Shen Valley Pure Water 2000 Forum

540.568.8793
\$1,825

Environmental Ed Conference

VA Institute of Marine Science

804.684.7384
\$12,000

Salt Marsh TBT Degradation

Chesapeake Volunteers in Youth

757.382.8153
\$15,000

Habitat Enhancement Projects

Students Against Global Abuse

703.810.2350
\$1,500

Native Species Recovery

Headwaters SWCD

540.248.4328
\$3,380

Bay Resources and Workshop

Horseshoe Crab Management....

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the highest horseshoe crab concentrations.

Concern for migratory birds and the impact of fewer horseshoe crabs on their spawning beaches, has led fisheries managers in New Jersey, Maryland and Delaware to reduce harvest and landings over the last two years. Recent studies in the Delaware Bay showed an alarming decrease in crab numbers in many locations. The Virginia Marine Resources Commission has not instituted similar monitoring of Virginia shores, but scientists with the Virginia Institute of Marine Science, the National Wildlife Refuge in Chincoteague and The Nature Conservancy, report significantly fewer horseshoe crabs than in previous years.

By 1998, landings were sharply increasing in Virginia, and some Virginia fishery managers and conservation groups had become concerned that Virginia had become "the loophole state," by allowing crabs that were harvested off-shore (and could not be landed legally in Delaware, New Jersey and Maryland) to be landed in Virginia instead, potentially undermining the efforts of our mid-Atlantic neighbors to the north. According to ASMFC (Atlantic States Marine Fisheries Commission, a multi-state fishery management body of which Virginia is a member), data and reports, New York and Massachusetts, which currently

have no harvest restrictions, but require a license to harvest horseshoe crabs commercially, also show a rise in horseshoe crab landings, to over a million pounds a year, which raises the question of other Atlantic states as possible "loophole" states. It should be noted, however, that the other Atlantic coastal states are also challenged with horseshoe crab management issues. Delaware and New Jersey still allow hand-harvest off their beaches during the spawning season, although this has been significantly reduced as a result of some restrictions. Inconsistent restrictions on crab harvest makes coastwide management of horseshoe crabs a challenge.

Regional Horseshoe Crab Management Measures

In the summer of 1998, the Virginia Marine Resources Commission chose not to promulgate regulations to control landings of horseshoe crabs in Virginia before a coast-wide management plan with state-by-state restrictions was adopted by the ASMFC.

In August 1998, the ASMFC issued a draft Interstate Fishery Management Plan (FMP) for the Horseshoe Crab. The draft FMP recommended a 25% reduction in coastwide landings from pre-1998 levels in each state. This reduction was based upon: a stock assessment which found that a conservative, coast-wide management strategy was necessary, catch and effort increases, evidence of localized declines, and a vulnerability due to overharvest and slow maturation rates.



VISIT THESE PUBLIC ACCESS SITES

Cape Charles Coastal Dune Trail and Overlook

Walk along this approximately 700-foot long raised boardwalk and get an up-close look at a primary and secondary coastal dune system on the southern end of Virginia's Eastern Shore. The boardwalk, which begins as a nature trail, extends from the Cape Charles Sustainable Technologies Industrial Park, through a new 28.8 acre Coastal Dune Natural Area Preserve in the park, out to a lookout with a breathtaking view of the Chesapeake Bay.



photo courtesy of Northampton County

Along the boardwalk, volunteers have restored native plants important to the migratory birds that travel down from the Northeastern U.S. and Canada each fall and stop here on the tip of the Delmarva to rest and feed. The native plants will provide food, shelter and protection, and include inkberry, winterberry, loblolly pine, eastern red cedar, common persimmon, downy serviceberry, sweetbay magnolia, and wax myrtle. The

boardwalk and surrounding habitat restoration were made possible through a \$60,000 grant to Northampton County from the Virginia Coastal Program.

The Coastal Dune Natural Area Preserve was purchased with funds awarded by the U.S. Fish and Wildlife Service to the Virginia Department of Conservation and Recreation, which then awarded the funds to Northampton County to purchase the land. The Virginia Coastal Program prepared the application for this National Coastal Wetlands Grant.



photo courtesy of Northampton County

In addition to the 28.8-acre preserve, an adjacent 4.3-acre parcel has been permanently preserved through deed restrictions by the neighboring Bayshore Concrete Products Corporation. Bayshore Concrete has also constructed a fence along their perimeter with the preserve to prevent any encroachment onto the preserve.

For directions to this new coastal preserve and boardwalk, please call Tim Hayes, Northampton County Sustainable Development Office at (757)331-1998. Cape Charles is about a two-hour drive from Richmond. 



photo by Virginia Witmer

White House Cove Pier

Visitors to White House Cove Marina on Bennetts Creek in the City of Poquoson will be greeted by a new 187-foot dock. The new dock replaces a dilapidated public pier that had become a safety hazard. A new pump-out station, located at the end of the dock, is the first to be offered at the marina. It is estimated that over 500 boats are moored in the cove.

The city also focused on habitat restoration at the marina site. Native plantings, including wax myrtle, highbush blueberry, and inkberry, and a wetland planting of saltmarsh cordgrass, will help pre-

vent erosion and provide wildlife habitat. The plantings will also help filter storm water run-off from a parking area which has been polluting Bennett's Creek.

Funding for removal of the old pier, construction of the new dock and pump out station, and the plantings, was provided in part through a \$48,000 grant from the Virginia Coastal Program. For more information about this project, or for directions to the marina, please call the City of Poquoson at (757) 868-3025. 

Horseshoe Crab Management...

Continued from page 9

Although an ASMFC technical committee and citizen advisory committee recommended that restrictions be placed on horseshoe crab harvest to err on the side of conservation, the ASMFC management board concluded that there was "insufficient data to support coastwide harvest reduction measures", but there was "too much at stake to delay the adoption of the management plan".

Citing the concern that a 25% reduction in horseshoe crab landings would not allow adequate harvest to meet Virginia's bait needs, Virginia introduced a motion to set no mandatory restrictions on landings. The board agreed to this motion, but encouraged Virginia and other states to cap 1999 landings.

A final Interstate Fishery Management Plan for the Horseshoe Crab was released by the ASMFC in October 1998. The ASMFC, in recognition of the Delaware Bay as an epicenter of the horseshoe crab fishery and the primary stopover area for migrating shorebirds, approved the following management option: the states of New Jersey, Delaware and Maryland must maintain existing state laws and regulations pertaining to the harvest and landing of horseshoe crabs, and other states were encouraged to implement a two day per week harvest prohibition within 1,000 feet of the mean low water between April 15 and June 15, horseshoe crab spawning season. Maryland would retain its harvest quota, the only state to have instituted a harvest quota, and Maryland, Delaware and New Jersey, would retain current harvest restrictions, including trip limits, times and locations for harvesting, and equipment restrictions. This cut the allowed harvest of crabs in these three states from 1.7 million to 676,000 crabs in 1998 (most of the 1.7 million crabs were trawl-caught in the near-shore waters of Ocean City). The plan imposes no quota restrictions on other states.

The ASMFC management board did approve a series of monitoring components to be implemented by all ASMFC member states, including mandatory monthly reporting, benthic sampling, coastwide survey workshops, and biomedical tagging.

The adopted ASMFC FMP also requires that all its member states identify potential spawning and nursery habitat by December 31, 1999. It also requires states to actively intervene to ensure that regulatory agencies are aware of the potential risks to horseshoe crabs from water quality degradation and habitat loss. For critical spawning beaches, the states are required to work with other agencies including the Corps of Engineers to prevent coastal erosion, and consider: designing long-term beach monitoring, acquiring adjacent land or easements or discouraging adjacent development, restricting beach vehicle and watercraft (e.g. jet-ski) activity during spawning season.

Current Management Measures in Virginia

As landings were restricted in the states of Maryland, Delaware and New Jersey, they rose in Virginia to 600,000 pounds by the end of 1998, a nearly twenty-fold increase from 57,000 pounds in 1997, due to trawling by fishermen from other states in the Exclusive Economic Zone (three miles off state shorelines to 300 miles.) The FMP is examining restricting harvest of crabs in the EEZ, which is under the jurisdiction of the National Marine Fisheries Service. Virginia's fishery managers expect total landings for 1998 may increase by about 1 million horseshoe crabs when all survey data from the National Marine Fisheries Service is available, and when more fishermen have reported their landings.

VMRC staff, concerned that 1999 landings would exceed one million pounds, recommended at the February 1999 Commission meeting that a landings cap be set at the 1998 levels. A coalition of state and national conservation organizations, led by Richmond Audubon Society, supported a cap, but testified that setting it at the 1998 rather than the previous year's level would codify, rather than close the "loophole". Watermen testified that any cap would limit their increasing need for bait.

At its regular monthly meetings on February 23 and March 23, the Commission adopted several horseshoe crab conservation measures. These actions followed a public hearing and a special review of findings from an ad-hoc panel on Virginia's horseshoe crab population, established by the Commission, which included three advocates of ecosystem management and ecotourism uses (bird conservation groups), three representatives of biomedical uses, and three fisher-

man or seafood buyers. Most significantly, the Commission established a landing cap on horseshoe crabs at its March meeting. This landing cap of 710,000 crabs includes in-state and out-of-state harvests landed in Virginia. Because the landings data used by the Commission to determine its cap have changed, this issue will be re-examined at the Commission's April 27 meeting.

At its February meeting, the Commission adopted regulations requiring fishermen to report all landings and harvests of horseshoe crabs. This is in compliance with a 1998 ASMFC FMP reporting and monitoring requirement for all Atlantic states. Fishermen and seafood buyers in Virginia are to report directly to VMRC on how many horseshoe crabs they buy, sell and catch. Virginia has had a mandatory reporting program since 1993 for harvest from Virginia waters. The biomedical industry, and scientific and educational institutions are also required to report their horseshoe crab use.

In February, the Commission also enacted a prohibition against harvesting horseshoe crabs along all beaches during the peak spawning season from May 1 through June 7. At the time of spawning, horseshoe crabs aggregate on beaches and are easily subjected to overfishing. According to VMRC staff, testimony by conservation organizations, coordinated by the Virginia Audubon Council, positively affected the Commission's decision to make it unlawful to harvest horseshoe crabs from any shore or tidal waters of Virginia, within 1000 feet, in any direction, of the mean low water line, during this period, with the exception of permitted biomedical users. This restriction exceeds the ASMFC FMP two day restriction during mean low water between April 15 through June 15, and honors a 1994 Chesapeake Bay Program commitment, signed by then-Governor George Allen, with respect to horseshoe crab conservation and management, including harvesting limits. Restricting harvest within 1000 feet of mean low water is also significant to horseshoe crab harvest in some tidal areas, such as Virginia's Eastern Shore barrier islands, where it could close many horseshoe crab fishing areas to pound netting during this spawning period.

According to VMRC staff, hand-harvest used to account for as much as 50 percent of horseshoe crab harvests in Virginia, however, with the surge in off-shore trawling in the state, hand harvest now accounts for less than 5 percent of the increased horseshoe crab harvest in Virginia. Although the actual degree of hand-harvest had not changed, protection of the horseshoe crab broodstock during the critical spawning period is a significant management measure.

The Virginia Institute of Marine Science, in cooperation with VMRC, has begun to identify critical horseshoe crab spawning habitat in Virginia's Chesapeake Bay region. This study will be conducted in conjunction with a VIMS project currently underway, funded by the Virginia Coastal Program, to survey dune systems in Virginia's portion of the Chesapeake Bay, characterize their geologic structure and develop a classification system. Horseshoe crabs require beaches of a particular structural character for spawning. Combining these two efforts provides a unique opportunity to efficiently and accurately assess suitable horseshoe crab habitat in the targeted study area.

On April 27, the Commission will hold a public hearing to decide whether to ban dredging for horseshoe crabs during their peak spawning season. This proposal was unanimously supported by the ad-hoc panel and will eliminate the possibility of exploiting the horseshoe crab at a vulnerable period in its spawning cycle in Virginia.

Horseshoe crabs are an important component of our ecosystem, and have been a demonstrated source of economic value. It is apparent that continued research on the numbers and dependency of horseshoe crabs is needed. A comprehensive horseshoe crab fishery management plan will consider both the long-term viability of the horseshoe crab resource and its place in the ecosystem, and the use of this resource by current and future generations of the fishing and non-fishing public.

For more information on horseshoe crab management in Virginia, please call Jack Travelstead, Chief, Fisheries Management, VMRC, or Lewis Gillingham, Fishery Management Specialist, VMRC, at (757)247-2200; fax: (757)247-8181; E-mail: jtravelste@mrc.state.va.us or lgillinga@mrc.state.va.us. For more information on the dunes and horseshoe crab habitat project, please call Lyle Varnell, Marine Scientist Supervisor, VIMS, at (804) 684-7159; fax: (804) 684-7179; e-mail: lyle@vims.edu.

Improving Water Quality in Virginia

Tax Incentives Will Protect Wetlands and Riparian Buffers and Promote Soil Erosion Control

Protecting the quality of Virginia's water supplies and waterways is a top priority with all Virginians. As a result, each year millions of dollars are spent from federal, state and local government coffers to treat and protect our waters.

In 1998, the Virginia General Assembly passed legislation introduced by Governor Jim Gilmore that allows local governments to provide additional protection to their waters without incurring out-of-pocket expenses. Localities can now grant tax incentives to encourage landowners to protect wetlands, riparian buffers and to develop erosion control structures, all of which will have a positive impact on water quality.

These new tools are strictly voluntary. They are a local option. The wetland and riparian buffer initiatives build on the Land Use Assessment program established in 1971 which has been used successfully by most counties and municipalities across Virginia. The new legislation enables localities not using Land Use Assessment the option of establishing tax incentives for wetlands protection and riparian buffers. The shoreline erosion control tax reduction option is written so that localities have latitude in developing criteria, conditions and restrictions covering a partial tax exemption.

Wetlands and Buffers

Under Title 58.1-3230 of the Code of Virginia, wetlands and riparian buffers have been added to the definition of "Real estate devoted to open-space use" under Chapter 36 on Land Use Assessment. For localities with existing Land Use Assessment ordinances, these can now be modified to include tax incentives for landowners preserving those areas. The changes also provide clarification in defining both these types of areas. These definitions, with additional language in Article 5, Chapter 36 of Title 58.1, also allow those localities that do not have Land Use Assessment ordinances to provide real estate tax exemption or reduction by ordinance on those properties perpetually protected by easements. Landowners have several options in seeking perpetual easements either through public bodies or private non-profit organizations.

Shoreline Erosion Control Structures

A separate piece of legislation also led to changes in Article 5, Chapter 36 of Title 58.1 (Other Exempt Property). A new section has been added to deal with the concept of "Environmentally Responsible Improvements." This gives localities the option of providing real estate reductions for the placement of permanent erosion control structures such as rock or concrete breakwaters, bulkheads, gabions, revetments or other structures installed to control erosion, or to abate or prevent pollution.

This new section provides a local option to create a local ordinance and authorizes the governing county or municipality to establish criteria for determining if real estate qualifies for the partial exemption authorized by this section.

Localities are encouraged to seek technical assistance from DCR's Shoreline Erosion Advisory Service when implementing this program. Please call Lee Hill, DCR/SEAS, at (804) 786-3998.

Benefits

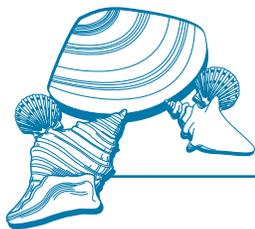
In addition to the scenic, aesthetic and ecological values of tree-lined streams and river banks, riparian buffers and wetlands play an integral part in reducing nonpoint source, or runoff, pollution. Nonpoint source pollution has been identified as the major water quality problem facing the Commonwealth today. Buffers and wetlands reduce levels of nitrogen, phosphorus and sediments running off farmland, residential lots, and our roads and streets, which would otherwise flow into our waters. The use of these new ordinances also rewards responsible landowner behavior, encouraging landowners to initiate the stewardship of our natural resources.

Localities will also enjoy the benefits of improved water quality, and streams and waterways that are safe and appealing for recreational use and, where applicable, commercial purposes. The decrease in tax revenue will vary by locality, however in many cases the lands being exempted for riparian buffers and wetlands have a much greater natural than commercial value, so loss of improvements on those lands is nominal. And, in localities where land use assessments are already in place, these lands are already taxed at lower value. In addition, a partial exemption for erosion control measures taken may be less than the actual loss of taxable real estate due to unabated erosion.

According to the Water Quality Improvement Act 10-1.2132.C, Water Quality Improvement Funds may be used for "reimbursement to local governments for tax credits and other kinds of authorized tax relief that provides incentives for water quality improvements." Localities interested in pursuing this type of reimbursement should contact the Department of Conservation and Recreation for more details and a competitive annual application.

Several model ordinances have been drafted. If you would like a copy of these ordinances or would like to learn more about model ordinances or land use assessments, call the Department of Conservation and Recreation at 1 (877)42-WATER (429-2837), or visit the DCR website at <http://www.state.va.us/~dcr/>.

This article was adapted from the fact sheet "Improving water quality: A Virginia priority...a local option" produced by the Department of Conservation and Recreation.



Virginia Coastal NPS Program Update

On January 5, 1999 the Department of Conservation & Recreation (DCR) held a Kick-Off meeting to introduce the process by which the state will update the Virginia Nonpoint Source Pollution (NPS) Program. The update is a program condition for continued Section 319 EPA funding, and must be submitted to EPA by August 1999. Participants invited to the meeting, including state agencies, planning district commissions, business and environmental groups, academics and other interested individuals. They were briefed by program staff on the mechanics of the update process, and invited to participate in one of the many work groups established to prepare the update.

As part of this NPS Program update process, DCR, a core agency of the Virginia Coastal Program, requested that the workgroups address the program conditions related to Coastal Zone Management Act Reauthorization Amendments Section 6217, which are specific to nonpoint source pollution within Virginia's coastal zone, and have multi-year conditions for approval.

In his opening remarks at the meeting, Virginia Secretary of Natural Resources J.P. Woodley emphasized the importance of the NPS program in supporting Virginia's commitment to the environment. He further stated that the Governor fully supports efforts to improve water quality and described the recent funding initiative presented by the Governor. Stu Wilson and Rick Hill, staff at DCR, gave a presentation on the process and schedule for the update. DCR Director Brickley provided closing remarks that emphasized the importance of public participation in the process.

The meeting was well attended, and those unable to attend the meeting expressed their support and interest in participating in this process. An update on the status of the process and meeting minutes will be available on the Virginia Coastal Program and DCR websites. (<http://www.state.va.us/~dcr/sw/npsupdt.htm>) Workgroups began meeting at the end of January. For more information please call Rick Hill at (804) 786-7119, Mark Slauter at (804) 692-0839 or Jody Aston at (804) 786-9737.

Marine Recreational Fishing Survey Contract Awarded

NOAA's National Marine Fisheries Service (NMFS) has awarded a Maryland company a contract worth nearly \$8 million dollars to conduct surveys that track the effort and catch of recreational saltwater fishermen throughout the country from 1999 - 2001.

Macro International, Inc. of Calverton, Maryland, will conduct what is known as the 1999 Intercept Survey for collection of comprehensive marine recreational fishing data as a component of the Fisheries Service's annual Marine Recreational Fisheries Statistics Survey. The agency estimates that more than 179,000 shore and dock-side interviews with anglers along the Atlantic and Gulf coasts will be conducted during the three-year survey.

The recreational survey, conducted since 1979, is used to provide a reliable database for estimating the impact marine recreational fishing has on the nation's marine resources.

The survey is comprised of two independent surveys: (1) a telephone survey of households to collect data on the number of salt water angling trips taken, and (2) a field survey of anglers' catch information.

In the last issue of the Virginia Coastal Program News, we reported on the new Atlantic Coastal Cooperative Statistics Program (ACCSP). The Marine Recreational Fishing Survey (MRFS) is a major component of the new ACCSP. Although the MRFS will not collect all data the ASSCP has identified is needed to improve fishery management decisions, ACCSP technical staff will continue to work with MRFS officials to improve the critical data collected in this survey.

For more details on the recreational survey and its options, please contact Maury Osborn, NMFS, Office of Science and Technology, Rm. 12456, 1315 East-West Highway, Silver Spring, MD 20910. Phone: 301-713-2316; e-mail: Maury.Osborn@noaa.gov.

Call For Nominations

The National Oceanic and Atmospheric Administration (NOAA) is accepting nominations for the 1999 Walter B. Jones Memorial and NOAA Excellence Awards for Coastal and Ocean Resource Management. Entries must adhere to the strict submission and judging criteria and must be received by June 30, 1999. There is no entry fee.

In the spirit of The Coastal Zone Management Act of 1972, the late Congressman Walter B. Jones authorized NOAA to honor American people and organizations for outstanding contributions in helping the Nation maintain healthy coastal and ocean resources, and balance them with human use. The program is open to individuals, organizations, state and local government agencies and their employees.

The award categories are: Walter B. Jones Memorial Awards: Coastal Steward of the Year, Excellence in Coastal and Marine Graduate Study, Excellence in Local Government. NOAA Excellence Awards for Coastal and Ocean Resource Management: Volunteer of the Year, Non-Government Organization (NGO) of the Year, Excellence in Promoting Diversity in Coastal or Ocean Resource Management, Excellence in Business Leadership, Excellence in Innovative Coastal Management.

For more information on the Awards, please call 301-713-3070, ext. 170; visit http://www.nos.noaa.gov/jones_award.html; or, e-mail jonesaward@ocean.nos.noaa.gov.

Check out these Web sites!

<http://www.csc.noaa.gov/coastalamerica/> — "The Bridge" - the first Internet clearinghouse for marine education resources. Includes more than 800 links to selected marine education sites.

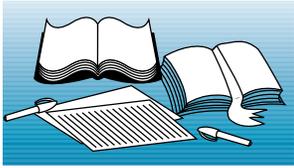
<http://www.epa.gov/grtlakes/seahome/grants.html> - EPA's Grant-Writing Tutorial, an interactive software tool that walks users through the grant-writing process and helps them learn to write more competitive grants.

<http://www.vwrrc.vt.edu/vwrrc/vwrrc.htm> - Electronic version of Virginia Water Central, the Virginia Tech, Water Resources Research Center newsletter. If you prefer to read the newsletter on-line, please send your e-mail address to water@vt.edu and you will be notified when a new issue is posted.

<http://www.rvares.er.usgs.gov/nrp/proj.bib/sav/wethome.htm> - highlights USGS ecological research in wetlands and submerged aquatic plants, and provides a resource of links to other SAV and wetland ecology web sites.

<http://www.veta.net> - Virginia EcoTourism Association

Correction: In a table accompanying our Summer/Fall 1998 newsletter article on songbird and raptor migration on Virginia's Eastern Shore, we reported in error the numbers of Red-tailed Hawk and Swainson's Hawk sighted on the shore as compared to Hawk Mountain, PA and Cape May, NJ. The numbers in our table should read: Swainson's Hawk: PA - 0, NJ - 3 and VA - 4; and for the Red-tailed Hawk: PA - 3,322, NJ - 4,163 and VA - 2,139. We apologize for the error.



COASTAL CONTRIBUTIONS

The following publications were funded by the Virginia Coastal Program:

Chickahominy Watershed Guide - Alliance for the Chesapeake Bay, November 1998:

The Alliance for the Chesapeake Bay, in partnership with the Chickahominy Watershed Alliance, published this public access guide which identifies existing landings, marinas, dams, campgrounds and sites of historical interest along the Chickahominy River. The guide also provides information on the river's natural resources, early history, water conditions and safety precautions. For copies of this guide, please contact the Alliance for the Chesapeake Bay at (804)775-0951.

Construction Site Chemical Control Handbook - Virginia Department of Conservation and Recreation - January 1998:

This handbook assists construction companies, contractors and others in preventing or controlling pollution from construction sites, caused by the improper handling and usage of chemicals. This handbook presents practical techniques and actions, or best management practices, that can minimize the impacts of construction activities on the environment from pollutants such as pesticides, nutrients, petrochemicals, construction chemicals, wash water and solid waste leachate. Copies of this handbook are available by calling the Virginia Department of Conservation and Recreation at (804)786-2064.

Proceedings of the 1997 Northeast Region Stranding Conference - Virginia Marine Science Museum - December 1998:

The Virginia Marine Science Museum Stranding Center hosted the 1997 Northeast Region Stranding Conference on March 27-29 in Virginia Beach. The Northeast Regional Stranding Network for marine mammals and sea turtles includes letterholders (those authorized by the National Marine Fisheries Service to respond to strandings) from Virginia to Maine. The Virginia Coastal Program has provided funding to produce a proceedings from this conference. The proceedings includes stranding reports from regional letterholders, a summary of 1997 regional strandings and abstracts of presented scientific papers. For more information on the conference, the Northeast Regional Stranding Network, or the availability of these proceedings, please call the VMSM Stranding Center at (757)437-4949.

The Environmental Resources Directory: A Guide to Environmental Information and Education in Virginia:

This guide to general, non-technical environmental information in Virginia includes nearly 400 products and services available from Virginia organizations and agencies. The guide is available on the Department of Environmental Quality web site at <http://www.deq.state.va.us/deq/eedir.html>. For a hardcopy, please send a self-addressed mailing label to: Kelly Heimbach, EE Directory, DEQ, 629 East Main Street, Richmond, VA 23219.

Managing Invasive Alien Plants in Natural Areas, Parks, and Small Woodlands:

Produced by the VA Dept. of Conservation and Recreation, Division of Natural Heritage, this publication is an introduction and guide to invasive plant management. This guide includes detailed information on the characteristics of specific plants, herbicides, and the effects of invasives on ecosystem processes. Please call (804)786-7951 for copies. DNH has also produced fact sheets on invasive plants which are available on the DCR-DNH web site at: <http://www.state.va.us/~dcr/vaher.html>.

Guide to Virginia's Laws, Regulations and Requirements for Marine Shellfish Aquaculture Activities:

Prepared by the Habitat Management Division of the Virginia Marine Resources Commission, this guide addresses both commercial and noncommercial activities and is directed at individuals currently involved in aquaculture activity and those interested in pursuing shellfish culturing in the future. For copies of the guide, please call the VMRC Habitat Division at (757)247-2200.

King William County Natural, Recreational and Historical Guide - King William County, Town of West Point, June 1997:

This guide highlights the historical, cultural and natural assets along the Mattaponi and Pamunkey Rivers and the Pamunkey-Mattaponi Trail in King William County. For a copy of this guide, please contact King William County at (804)769-4927, or the Town of West Point at (804)843-4620.

Other Coastal-Related Publications Now Available:

Proceedings from the Workshop - Trends and Future Challenges for U.S. National Ocean and Coastal Policy:

Held on January 22 and sponsored by the National Ocean Service, the Ocean Governance Study Group, and the University of Delaware Center for the Study of Marine Policy. The workshop examined trends and future challenges likely to affect U.S. national ocean and coastal policy in the next 25 years. For a copy of the proceedings, please call Catherine Johnson at the Center for the Study of Marine Policy at (302)831-8086.

This Place Called Home: Tools for Sustainable Communities - Alliance for Community Education:

This 60 minute CD-ROM focuses on innovative community projects around the U.S., and includes interviews with national leaders, everyday citizens, government officials, educators, and businesses driving change on an institutional and grassroots level. Featured stories explore ways that communities are working to become compatible with natural systems and issues of place, scale, diversity, history, leadership, education and change. Laura McKay, Virginia Coastal Program Manager, is among those interviewed about her work with Northampton County on the Eastern Shore. Copies of the CD-ROM are available for \$25 plus \$1.50 postage (bulk discounts available). To order, mail check payable to: Alliance for Community Education, 2041 Shore Drive, Edgewater, MD 21037 or call (410)956-1001.

Marine Ecosystems: Emerging Diseases as Indicators of Change - Global Change Program, Harvard University:

Looks at new methodology that views disease as an indicator of marine health. This report looked at numerous databases to track disease trends in marine ecosystems and found evidence that new diseases are emerging and old diseases are reappearing across a wide range of marine life. These diseases affect coral, seagrasses, fish, turtles, and other marine life. The report also shows increases in reports of harmful algal blooms and red tides. For copies of the report, call (617)432-0493.

National Ocean Conference Proceedings:

The National Oceans Conference, hosted by the Department of Commerce/NOAA and the Department of the Navy, was held in Monterey, California on June 11-12, 1998 as part of Year of the Ocean activities. This was the first national meeting of its kind. The conference set out to raise ocean issues to a higher priority on the national agenda and begin a serious dialogue among those who will shape the future of the world's oceans. For a copy of the conference proceedings, please call NOAA's Office of Public and Constituent Affairs at (301)713-1208 or fax your request to (301)713-1211.

Oyster Reef Communities in the Chesapeake Bay (ORCCB):

ORCCB is an educational CD-ROM (for Mac and IBM) being developed by the Virginia Institute of Marine Science to communicate the results of ongoing VIMS Molluscan Ecology oyster reef research and restoration activities to the general public. The CD-ROM is being sponsored by Virginia's Chesapeake Bay Restoration Fund, the VIMS Department of Fisheries Science, and Virginia Sea Grant. The importance and relevance of oyster reefs in the Chesapeake Bay are described using text-book

style chapters combined with interactive simulations based on actual research results. The CD-ROM software will be supported by full documentation as well as on the ORCCB web site at <http://www.vims.edu/fish/oyreef/orccb.html>. Version 1.0, for high school and science educators, will be available this May. For more information on the ORCCB CD-ROM, please contact Juliana Harding, VIMS Department of Fisheries Science, e-mail: jharding@vims.edu, or Vicki Clark, VIMS Marine Advisory Services, e-mail: vlark@vims.edu 

Research at the Virginia Marine Science Museum Stranding Center

by Mark Swingle, Stranding Center Curator

At the Virginia Marine Science Museum, visitors are entertained with exciting, innovative and thought provoking exhibits and programs which bring Virginia's marine environment to life. Behind every one of those exhibits and programs is a tremendous amount of scientific knowledge gathered over many years of careful observation, data collection and experimentation. Most visitors enjoying the museum don't think about the process by which the information was gathered and probably don't realize that the museum is actively involved in scientific research.

The Stranding Program has been involved with research on Virginia's marine environment for more than ten years. When the stranding Program began in the late 1980's, we participated in the investigation of a mass mortality of bottlenose dolphins along the U.S. east coast. That experience exposed us to the wonder of discovery which comes from examining these marine animals in a careful and systematic way. We were also surprised by the lack of knowledge about the seasonal bottlenose dolphin population in Virginia coastal waters. Dolphin numbers, distribution, seasonal movements and mortalities, and regional life history parameters such as diet, age/size at maturation and reproductive cycles were little studied and poorly known. As often happens in the scientific pursuit of knowledge, the investigation of the dolphin mass mortality gave rise to a host of unanswered questions about the nature of coastal bottlenose dolphin populations.

With our new found interest in these animals, the Virginia Marine Science Museum Stranding Program was created. We began by responding to stranded marine mammals and soon added sea turtles to the list. We quickly realized how to collect valuable information from strandings through careful observation, record keeping and sampling protocols. As a result of the dolphin mass mortality, we embarked on a long-term study of bottlenose dolphins along Virginia's coast. Our research goals cover several major areas including: stranding response and data collection; photo-identification of individual dolphins; and surveys of dolphin distribution, number and behavior.

The Stranding Program's dolphin photo-identification project (since 1988) and annual Dolphin Count coastal survey (since 1993) are examples of these efforts.

The early 1990's brought a dramatic increase in the numbers of humpback whales in Virginia's coastal waters in winter. We expanded our research to include photo-identification and surveys of these whales. Our interest in sea turtles led to a joint study (with the Virginia Institute of Marine Science and the Columbus Zoo) of the early growth potential of loggerhead sea turtles. Hatchlings from Virginia were raised in aquariums for several years and then released to the wild with satellite transmitters designed to monitor their

movements and behavior. This sea turtle project is a good example of how research can lead to exhibit development. Much of what we learned from our research has been applied to the museum's sea turtle exhibits which are the finest in the country.

Staff, volunteers and interns participate in Stranding Program research. In the early days, most of our efforts were on a volunteer basis. Grants and donations to the Stranding Program in recent years have allowed us to hire a limited amount of contractual research staff. The Virginia Coastal Resources Management Program and the National Marine Fisheries Service have provided much of our research grant funding.

Research projects require the use of many different techniques and skills. Techniques such as necropsy (animal autopsy), photo-ID, and aerial, vessel and shore-based surveys help our research teams answer puzzling questions and discover new information about these marine animals. In the future we hope to expand and upgrade our Stranding Center facilities, add additional research staff and acquire additional resources such as a research vessel suitable for offshore and winter surveys.

Research is exciting, challenging and crucial to our understanding of Virginia's marine environment. Through research by the VMSM Stranding Program, the museum is playing an important role in the conservation of marine animals and contributing valuable knowledge to the public in the form of new information used in exhibits and programs.

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Editors Note: The Virginia Marine Science Museum (VMSM), operated by the City of Virginia Beach, is a non-profit science facility dedicated to increasing the public's knowledge of the Commonwealth's marine environment. The Stranding Program at VMSM has been a recipient of funding from the Virginia Coastal Program since 1995. The VMSM Stranding Team works with the Virginia Institute of Marine Science (VIMS) to manage the National Marine Fisheries Service Salvage and Stranding Network in Virginia. Stranding data are compiled in the marine mammal stranding database at VMSM and the sea turtle stranding database at VIMS.

In addition to support for VMSM stranding activities, the Coastal Program has supported the following research projects by the VMSM Stranding Program:

- Teaching Virginia's Boat & Personal Watercraft Operators to Recognize & Respect Marine Species
 - Analysis and Mapping of Virginia Marine Mammal Stranding Data
 - Bottlenose Dolphins in Virginia Tidal Rivers - A Volunteer Effort
 - Sighting Patterns of Migratory Bottlenose Dolphins in NC and VA
- For more information on these projects, or the VMSM Stranding Program, please call Mark Swingle, (757)437-4949.

For more information about the VIMS Stranding Program, please call Jack Musick at (804)684-7029. You can also contact the Virginia Department of Game and Inland Fisheries, which has also conducted research on Virginia's marine animal populations, and worked on the Bottlenose in Virginia's Tidal Waters project. Please call Tom Wilcox, DGIF, at (804)367-0909.

Coastal Calendar

April 25 - 29 *Primo 10, Tenth International Symposium on Pollutant Responses in Marine Organisms*, College of William and Mary, Williamsburg, VA

Symposium will cover a wide range of subjects in aquatic toxicology, concentrating on the molecular and cellular mechanisms involved in responses of marine species to pollutants, including aspects of biotransformation and signal transduction involved in species susceptibility. Registration fee. For more information and to register, please contact the Virginia Institute of Marine Science, at (804) 684-7231, e-mail: or visit the conference web site at <http://www.vims.edu/env/meetings/primo/index.html>

June 6 - 12 *Society of Wetland Scientists 20th Annual Meeting*, Norfolk, VA

Contact: Harold Jones at (757)441-7777 or e-mail: harold.r.jones@usace.army.mil or sws@vims.edu. Also see the SWS web site at <http://www.sws.org/norfolk99/>

June 16-18 *Virginia's Sustainable Future Conference*, Richmond, VA

Contact: Marty Malloy, Convention Connections, (804)260-1500 or e-mail: malloymsm@aol.com.
See story page 1.



June 22-24 *Ninth Annual Environmental Education Conference*, Hampton, VA

Conference will focus on Virginia's coast, the Chesapeake Bay and water quality. Teachers, community educators and program specialists from schools, government agencies, museums, businesses, nature centers and parks should plan to attend for hands-on workshops, curriculum materials, presentations on current issues, and guided educational field trips. Registration fee required. Registration information and forms will be available on DEQ's web site at <http://www.deq.state.va.us>. To receive a form, send a self-addressed mailing label to: EE Conference, DEQ, PO Box 10009, Richmond, VA 23240-0009.

July 24-30, 1999 *Coastal Zone 99, "The People, The Coast, The Ocean - Vision 2020"* San Diego, CA.

Conference will focus on coastal and ocean resources management themes: the human dimension, the ocean realm, the watershed perspective, and public connection. For more information contact: CZ99 Secretariat, Urban Harbors Institute, University of Massachusetts BOSTON, 100 Morrissey Blvd., Boston, MA 021215-3393 or e-mail: CZ99@umbosky.cc.umb.edu, or contact Martin Miller (601)634-3999.

If you would like to add an event or deadline to the Coastal Program News or web site calendar, please call Virginia Witmer, Newsletter Editor at (804)698-4320 or e-mail: vgwitmer@deq.state.va.us

COASTAL PROGRAM NEWS

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